UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF COMMERCIAL FISHERIES

CALIFORNIA FISHERY MARKET NEWS MONTHLY SUMMARY

May 1963

Part II–Fishing Information*

Sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists

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Bureau of Commercial Fisheries
Biological Laboratory
P. O. Box 6317, Pt. Loma Station
San Diego 6, California

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BLUEFIN TUNA CROSSES THE PACIFIC

The Inter-American Tropical Tuna Commission announced on May 27, 1963 that a bluefin tuna tagged by one of its scientists had been recaptured by a Japanese vessel south of Japan.

The recaptured fish was one of seven tagged on February 2, 1958 from a school caught off the south end of Guadalupe Island, Mexico, by the purse-seiner Columbia. The seven mentioned were among a total of 121 bluefin marked and released from Columbia in the same general region on the trip. The fish released were about three feet in length and weighed 30 to 35 pounds.

According to Dr. Hiroshi Nakamura, Director of the Nankai Regional Fisheries Laboratory in Kochi, Japan, who sent the tag and recovery information to the Bureau of Commercial Fisheries Biological Laboratory in San Diego, the tagged fish was recaptured on April 23, 1963 by a small Japanese longliner Ryuho-Maru #8. The position of recovery was latitude 29°03' N., longitude 139°42' E., just north of the Bonin Islands. When brought to port, the fish had already been gilled and gutted but was, nevertheless, an impressive 242 pounds. It was six feet in length.

This recovery now holds the record for the longest period that a tagged tuna of any species has been free prior to recapture. It provides extremely valuable information to the scientists studying tuna in regard to age and growth and migratory behavior. Of great importance is the fact that the bluefin of the eastern and western north Pacific apparently intermingle. The extent of mixing, of course, remains to be learned.

Tuna Commission scientists have, in the course of their investigations, tagged over 100,000 yellowfin and skipjack, but only the 121 bluefin noted, because they are not primarily concerned with the eastern Pacific bluefin. Bluefin are under study by the Bureau of Commercial Fisheries and the California Department of Fish and Game. In 1962, they jointly began the first large-scale tagging program on this species which they plan to continue this summer. Dr. Nakamura's laboratory is also planning to conduct bluefin tagging this summer in waters around the Japanese Home Islands.

TEMPERATE TUNA FORECAST 1963

In May 1961, the staff of the Tuna Forecasting Program of the U.S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, issued its first prediction for the southern California albacore fishery. This forecast, based on average winter coastal temperatures at Scripps Pier, La Jolla, and Balboa, California, was limited to a prediction of the total amount of albacore expected to be taken from waters south of the International Border between the United States and Mexico. Subsequent events proved the estimate to fall well within the limits of accuracy expected. The 1962 forecast included not only a statement on how much albacore was expected from the region south of the International Border but also a prediction of where the onset of the fishery was expected in late June and July. The forecast area of the July albacore fishery proved to be good, but the season's estimated total catch south of the border fell far short of that predicted. In addition, a statement was given on the quantity of bluefin that would be taken from waters north of the International Border. The amount of bluefin taken from these waters was much higher than anticipated.

As was stated in our forecast last year, the prediction was made with the assumption that fishing effort would be substantially the same as in previous years. This assumption proved satisfactory for the albacore fishery. It is believed that the 1962 albacore catch fell short of the mark predicted because of rapid warming of ocean temperatures in August off Baja California and southern California. Also, an extensive warm temperature anomaly developed in California offshore waters in July and August, which appeared to cause late incoming migrants to enter the fishery farther north than usual. This observation was substantiated by the catch of Navy picket vessels from offshore waters for July and August of 1962. (See January 1963 issue of California Fishery Market News Monthly Summary - Part II, Fishing Information.)

Severe economic distrubances confronting the industry this year (caused by recent adverse publicity given the canned tuna product) could result in a substantial reduction in fishing effort. Forecasts are made again this year on the assumption that fishing effort will not deviate to any large extent from that in the past.

The region expected to produce the best albacore catches in the month of July is outlined in Figure 1. This area is determined from April temperature and salinity data taken over a wide area at a depth of 10 meters. These data are combined to produce a "catch index". The area of optimum catch predicted by the 1963 catch index is situated farther north than last year's (see May 1962 issue of California Fishery Market News Monthly Summary - Part II, Fishing Information) and reflects an increase of both temperature and salinity in the region off southern California and Baja California. Sea temperatures off San Juna Seamount and Pt. Conception

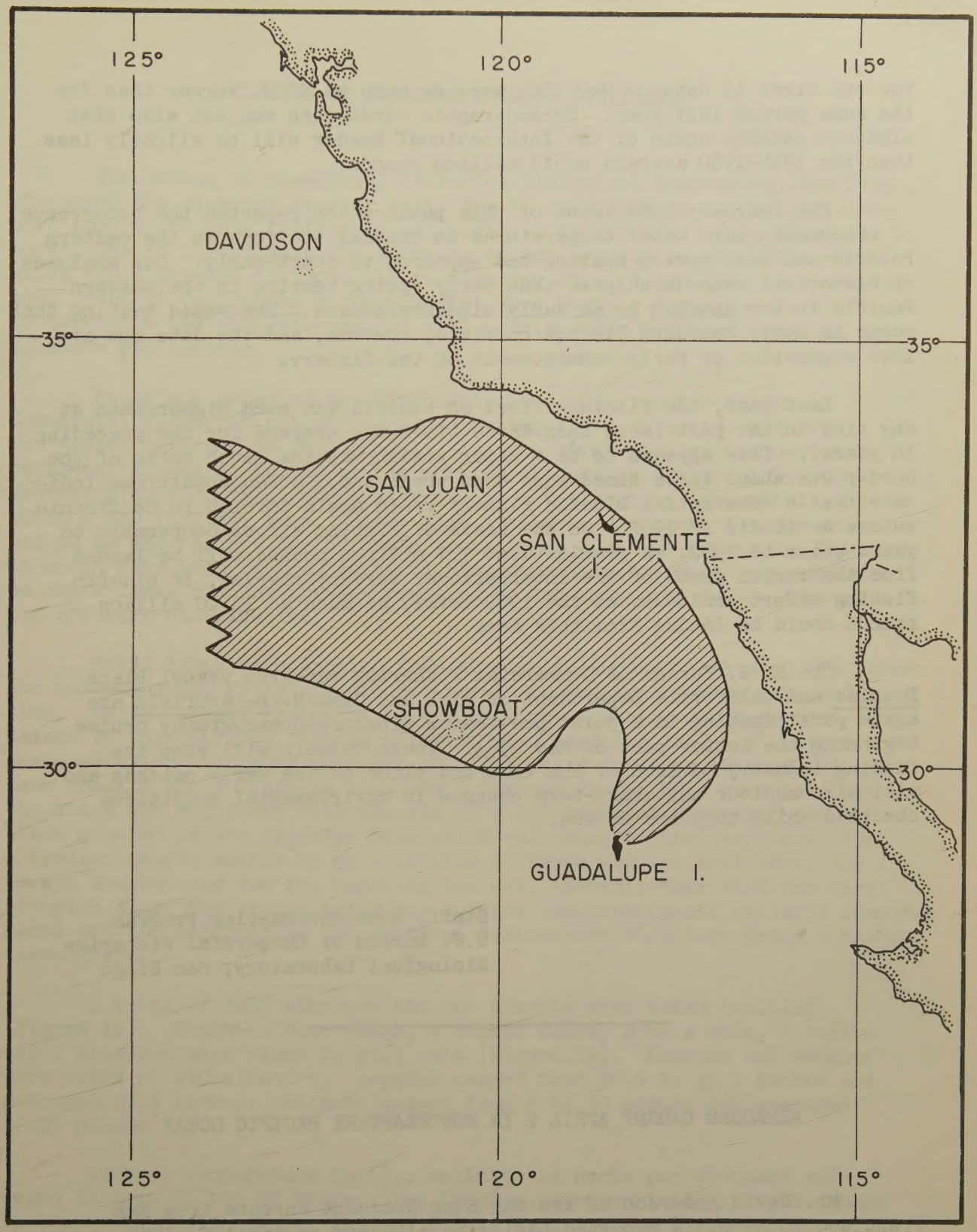


Figure 1.--Cross-hatched region delineates the area expected to produce about two-thirds of the total July 1963 albacore catch.

for the first 15 days of May 1963 were as much as 3° F. warmer than for the same period last year. Oceanographic conditions suggest also that albacore catches south of the International Border will be slightly less than the 1945-1960 average of 15 million pounds.

The February 1963 issue of this publication reported the occurrence of abnormally warm water temperatures at coastal stations in the eastern Pacific and that spring heating had appeared to start early. Our analyses of historical records suggest that early spring heating in the eastern Pacific is accompanied by an early albacore season. The rapid heating that began in early February did not continue, however, and the data now are less suggestive of early commencement of the fishery.

Last year, the fishing effort on bluefin was much higher than at any time in the past (more than three times the average for the preceding 10 years). This appears to be a major reason why the catch north of the border was about three times more than predicted. Ocean conditions indicate that a substantial bluefin fishery could again develop in California waters as it did in 1962. On the basis of fishing effort comparable to years prior to 1962, we predict that 7.7 million pounds will be landed from the region north of the International Border; however, if bluefin fishing effort continues at the 1962 level, as much as 15-20 million pounds could be landed from this area.

The U. S. Bureau of Commercial Fisheries research vessel Black Douglas and California Department of Fish and Game N. B. Scofield are again participating in a joint pre-season albacore-Oceanography cruise beginning the latter part of May 1963. These vessels will keep the fishing industry advised of the time and place of the early catches and will also monitor any short-term changes in environmental conditions observed while they are at sea.

Staff, Tuna Forecasting Program
U.S. Bureau of Commercial Fisheries
Biological Laboratory, San Diego

ALBACORE CAUGHT APRIL 2 IN NORTHEASTERN PACIFIC OCEAN

Mr. David Anderson of the tug Star Crescent enroute from San Francisco to Honolulu reported taking an albacore on April 2, 1963 at 30°03' N., 138°49' W. approximately 1000 miles southwest of San Francisco. Water temperature at time of catch was 65° F. Length of fish was 20-1/4 inches.

CHARTER OF ALBACORE TROLLER POLLY ANN

The Bureau of Commercial Fisheries Biological Laboratory, San Diego, chartered the albacore troller Polly Ann in July 1962 to conduct an albacore survey off Baja California and southern California. Purpose of the survey was to investigate the accuracy of our prediction as to the area which would produce the most albacore during July (Figure 1A; also see May 1962 issue of California Fishery Market News Monthly Summary - Part II) and to determine the effectiveness of gill netting as a means of sampling the albacore population.

Polly Ann departed San Diego July 12, 1962 with two Bureau of Commercial Fisheries scientists accompanying the regular two-man crew. The vessel returned to port on July 31. The first station was occupied northwest of Cedros Island on the morning of July 14 (Figure 1A). The general plan throughout the cruise was to cover regions both within and outside the forecast area. Since time available was limited, compromises had to be made on how far offshore track lines could be extended. Ideally, it would have been desirable for fishing operations to have been conducted on track lines running further westward to determine the full extent of the offshore distribution.

Seven lines were trolled from sunrise to sundown each day. To cover the maximum area, Polly Ann did not remain in any area for an extended time. Daily catches represent only a portion of what would have been obtained by concentrated fishing efforts. Two shackles of 7-1/2" (stretched measure) nylon gill nets were set at night at 13 stations (Figure 1A). Each shackle was 50 fathoms long and 6 fathoms deep. Nets were laid over the stern and retrieved with the aid of a 13" diameter hydraulic power block mounted on the midships boom which was swung to the starboard side. A troller adapts easily to gill netting if three men are available, one for vessel control and two for handling the net. Seventy-four stations were occupied along the cruise track for surface temperature and salinity measurements and for determining the vertical temperature structure using a bathythermograph.

A total of 1239 albacore and one bluefin were taken trolling (Figure 1A). Fourteen blue shark, 7 bonito shark, 2 mola mola, 1 bonito and 1 albacore were taken in gill nets (Figure 1A). Lengths and weights were taken of 440 albacore. Lengths ranged from 20.5 to 35.5 inches and averaged 25.5 inches. Weights ranged from 6 to 30 pounds and averaged 12.25 pounds.

Surface temperature in °F., salinity in parts per thousand and depth in feet to top of thermocline (region characterized by rapid change in temperature with change in depth) have been contoured and are shown in Figure 1B-D. Surface temperature and salinities were lowest in the northwesternmost part of the area covered. A tongue of this low temperature-low salinity water penetrated to the region between Guadalupe Island and

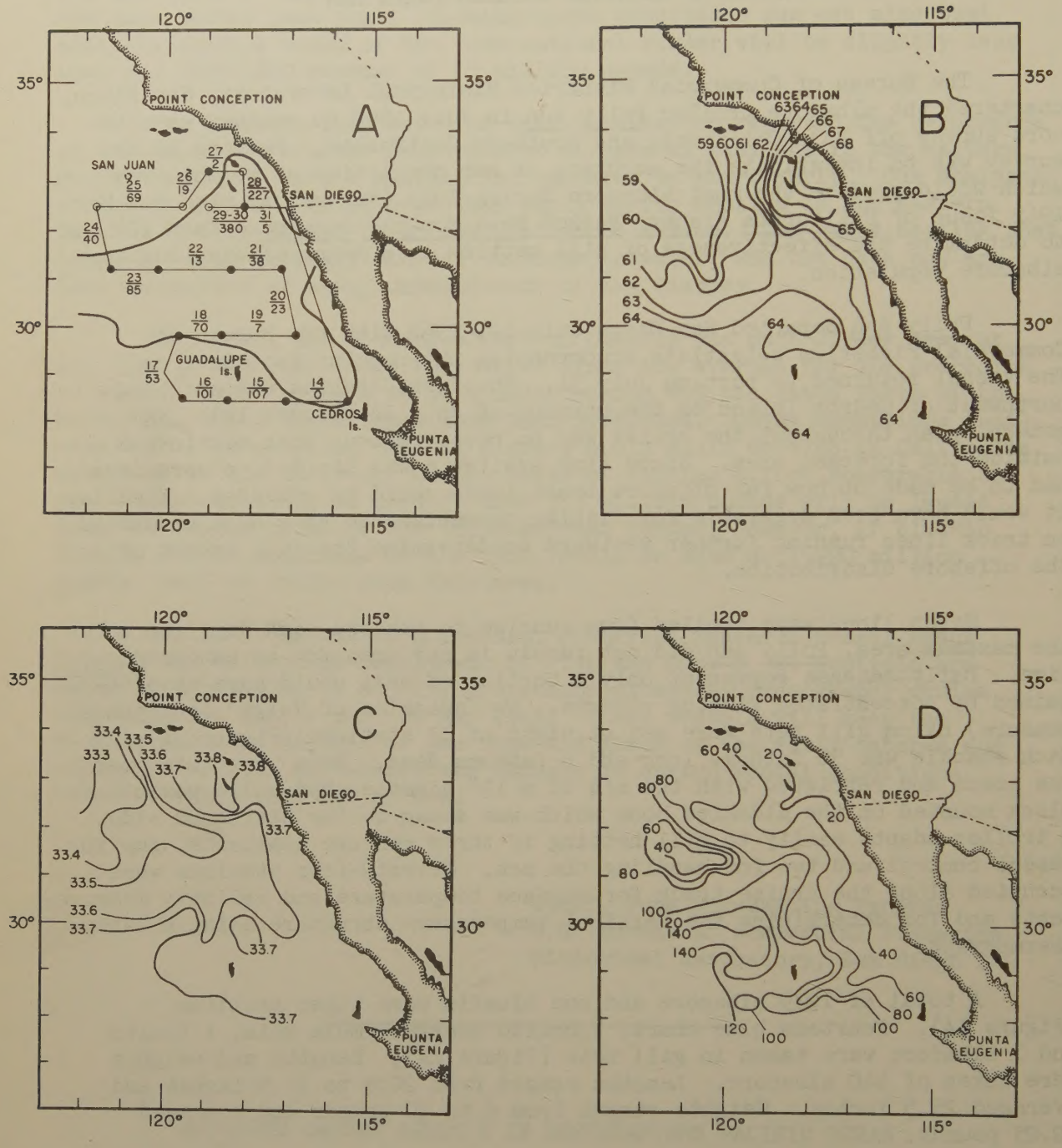
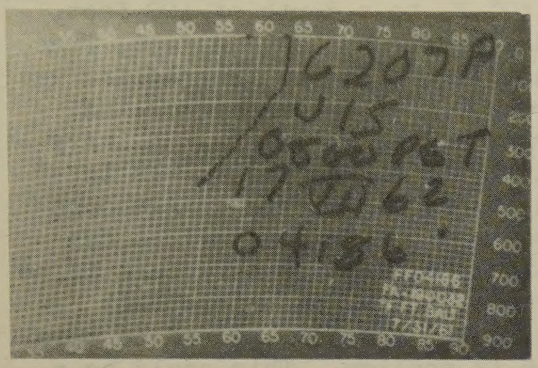
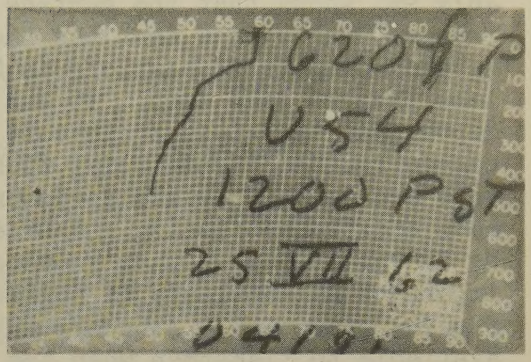


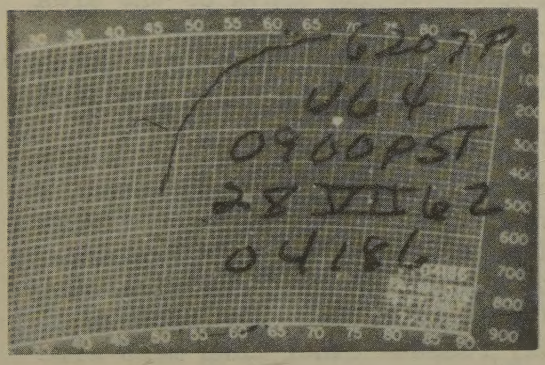
Figure 1.--(A) July 1962 cruise track of Polly Ann is shown by light line. Open dots indicate drifting at night, closed dots drifting at night on gill nets. Numbers on cruise track indicate date and catch - date above line, number of albacore below. (B) Surface water temperature °F. (C) Surface salinity °/₀₀ (parts per thousand). (D) Depth to top of thermocline in feet.



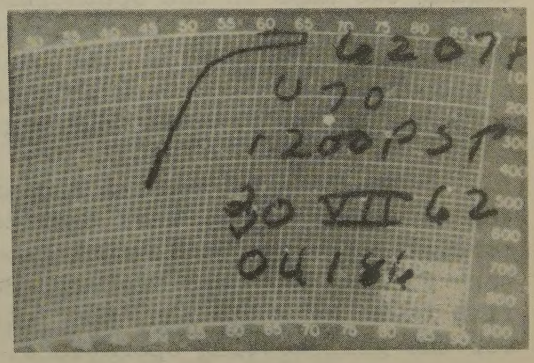
TRACE 1



TRACE 2



TRACE 3



TRACE 4

Figure 2.--Four bathythermograph traces taken by Polly Ann.

Baja California. Historical records indicate that the further south low temperature-low salinity water penetrates, the further south the albacore population moves. Surface temperatures and salinities were highest in the region between San Diego and San Clemente Island.

Four bathythermogram (BT) traces are shown in Figure 2. The first trace July 17 west of Guadalupe Island shows that the surface layer water was 64° F. to a depth of 150 feet. At that depth, the water temperature began to decrease gradually. Trace 2, taken south of San Juan Seamount on July 25 shows that the surface layer was 59° F. to a depth of 100 feet. Traces 3 and 4 show that the thermocline depth was shallow; in fact, Trace 3 taken on July 28 east of San Clemente indicates that the thermocline was less than 20 feet deep. It was in this area of shallowest thermocline depth that the highest albacore catches were made by Polly Ann. A heavy concentration of commercial fishing vessels (both jig and bait) was in this area and the vessels encountered high success in fishing. Although much additional fishing and BT data are required before conclusions can be drawn, it may be that knowledge of vertical temperature structure is as important as knowledge of surface temperatures to fishermen for their fishing operation. Albacore may aggregate nearer the surface and be more available to fishermen when the thermocline is shallow. This could be a direct response to temperature, or an indirect one as a result of food concentration or other factors.

Catch distribution data taken by Polly Ann and data compiled by the California Department of Fish and Game from log books suggest that albacore were commercially available through much of the region that we had predicted would produce good fishing. Heaviest concentrations located by Polly Ann were at the northern extremity within the predicted area and during two days on the southernmost leg slightly to the south of the area predicted. Whereas, the northern area produced many pounds commercially over an extended period, the concentration to the south disappeared quickly, although a few boats were able to catch several tons after being notified by Polly Ann of fish in that region.

Use of gill nets as a means of sampling the albacore population was not successful. Work carried out in years past by the Bureau of Commercial Fisheries Biological Laboratory, Honolulu, and Bureau's Exploratory Fishing and Gear Research Base, Seattle, indicate that for size of fish taken by Polly Ann, the 7-1/2" mesh should have been near optimum for the gill netting operations. Apparently reasons other than mesh size were responsible for lack of success using nets.

James H. Johnson
Chief, Tuna Forecasting Program

SEA SURFACE TEMPERATURE CHARTS, EASTERN PACIFIC OCEAN
MAY 1963

Acknowledgments

The following organizations and stations contributed data for the May 1963 charts:

U.S. Weather Bureau, San Diego, California
U.S. Weather Bureau Ship Visitation Office, Long Beach, California
U.S. Naval Communication Station Balboa, Fort Amador, Canal Zone
U.S. Coast Guard, Port Hueneme Light Station, Port Hueneme, California
U.S. Bureau of Commercial Fisheries Biological Laboratories, Honolulu, Hawaii; La Jolla, California; Seattle, Washington
U.S. Bureau of Commercial Fisheries, Exploratory Fishing and Gear Research Base, Seattle, Washington
California Department of Fish and Game, R/V N. B. Scofield
Guadalupe Island, Coronado Island, Ensenada, Cedros Island and Almejas Bay by Pedro Mercado of the Universidad Autonoma de Baja California, Ensenada, Mexico
Hopkins Marine Station, Pacific Grove, California by J. P. Balesteri
Inter-American Geodetic Survey by Rene Cortes at Salina Cruz, Mexico; David Ortega at Manzanillo, Mexico; Romeo Valencia at Pt. San Jose, Guatemala; R. Perierra at Pt. Armuelles, Panama; V. E. Castillo at Tumaco, Colombia; S. Zambrano at San Cristobal, Galapagos; N. Valenzuela at La Libertad, Ecuador, M. Vilela at Talara, Peru; Juan Andia at San Juan, Peru
Inter-American Tropical Tuna Commission, La Jolla and Terminal Island, California
Kelco Company, San Diego, California
Pacific Oceanographic Group, Nanaimo, British Columbia, by H. J. Hollister from observations by R. W. Collins at Quatsino Lightstation; N. R. Shrimpton at Cape St. James Light; B. Stuart at Amphitrite Point Light; J. M. Hartt at Langara Island Light
Scripps Institution of Oceanography, La Jolla, California by Margaret Robinson and Hans Klein
Ship Julia B

Charts

Figure 1.--Mean sea surface temperatures (°F) derived from approximately 8000 observations. Squares show temperatures at weather-ship stations. Numerals on shore are temperatures at coastal and light stations.

Figure 2.--Deviation of sea surface temperatures (°F) from long term mean charts of H.O. 225. Hatched areas are colder than mean.

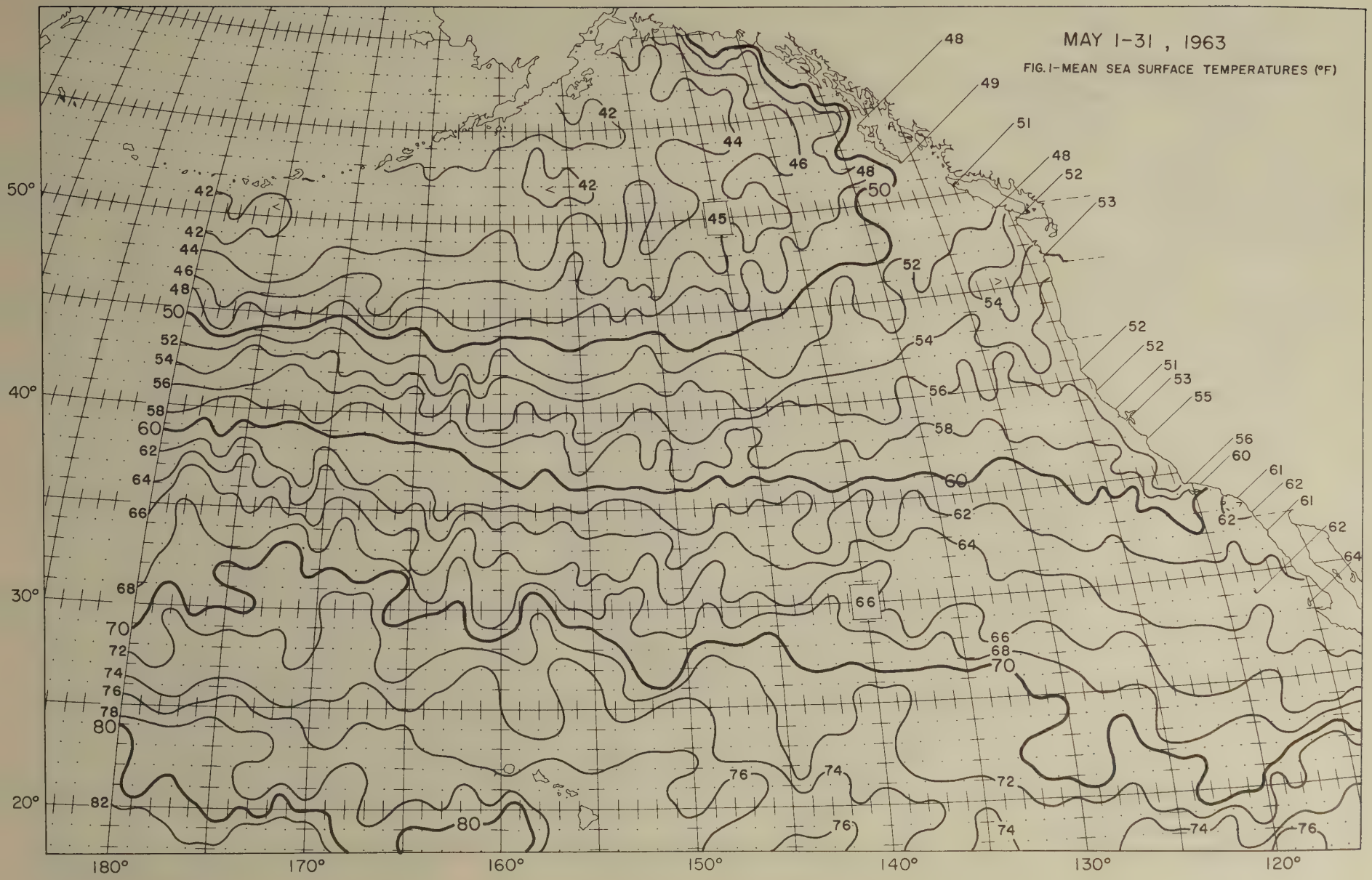
Figure 3.--Deviation of sea surface temperatures (°F) from those of May 1962. Hatched areas are colder than 1962.

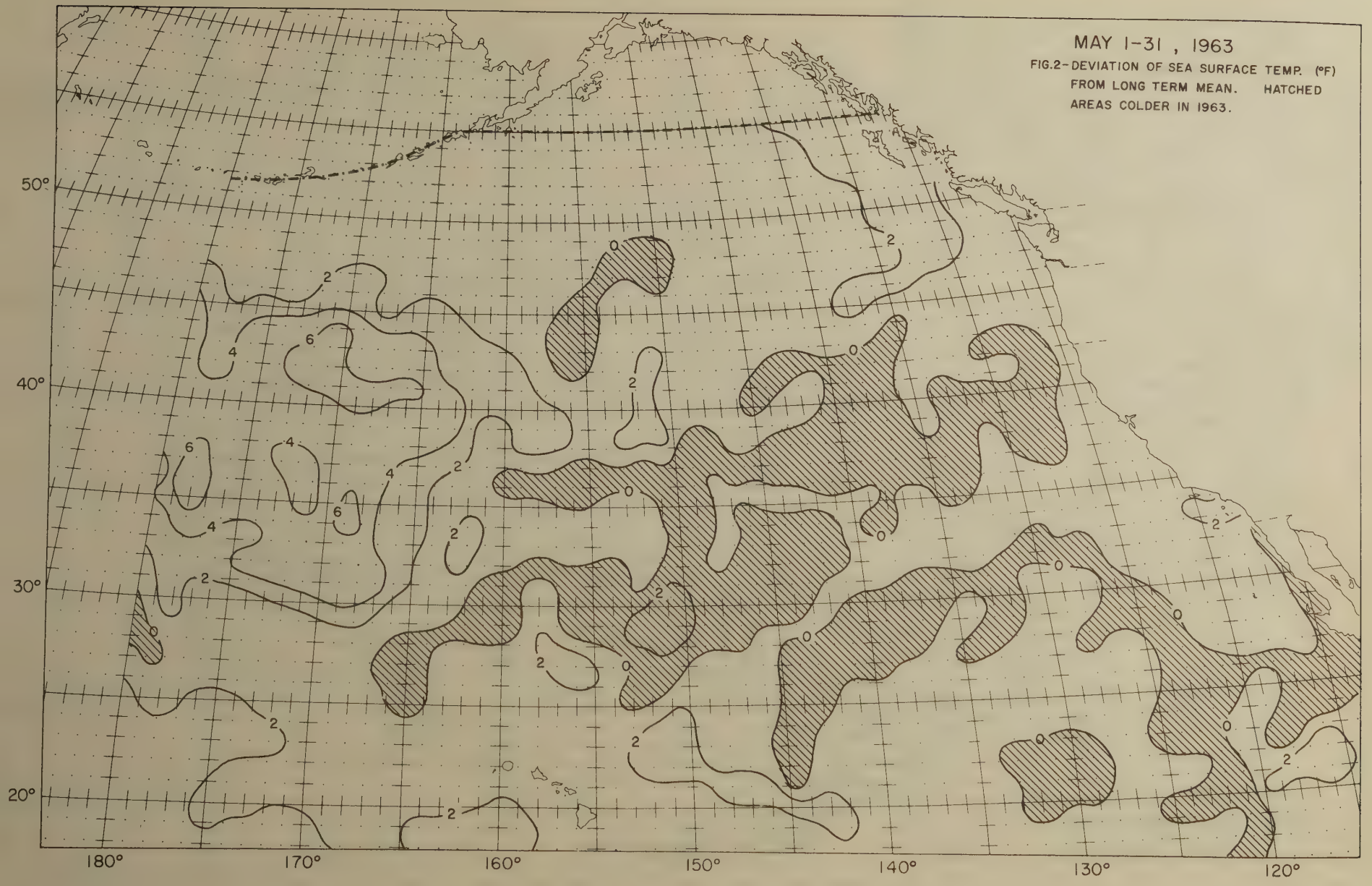
Figure 4.--Sea surface temperatures (°F) by 1-degree squares, approximately 2000 observations. Line under temperatures indicates average of two or more observations. Numerals on shore are temperatures at coastal and light stations.

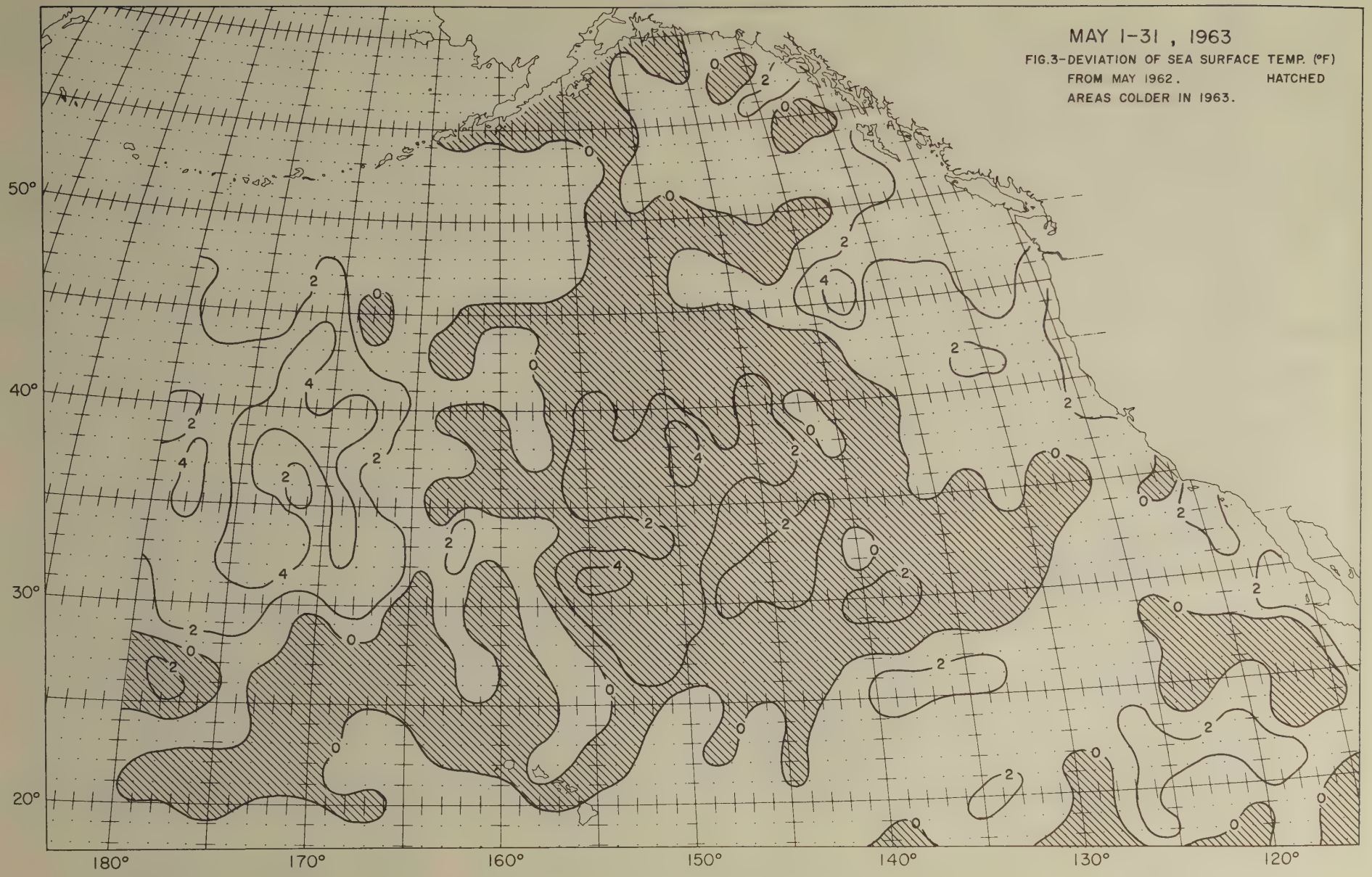
Figure 5.--Deviation of sea surface temperatures (°F) May 1963-May 1962 by 1-degree squares. Shaded areas colder in 1963.

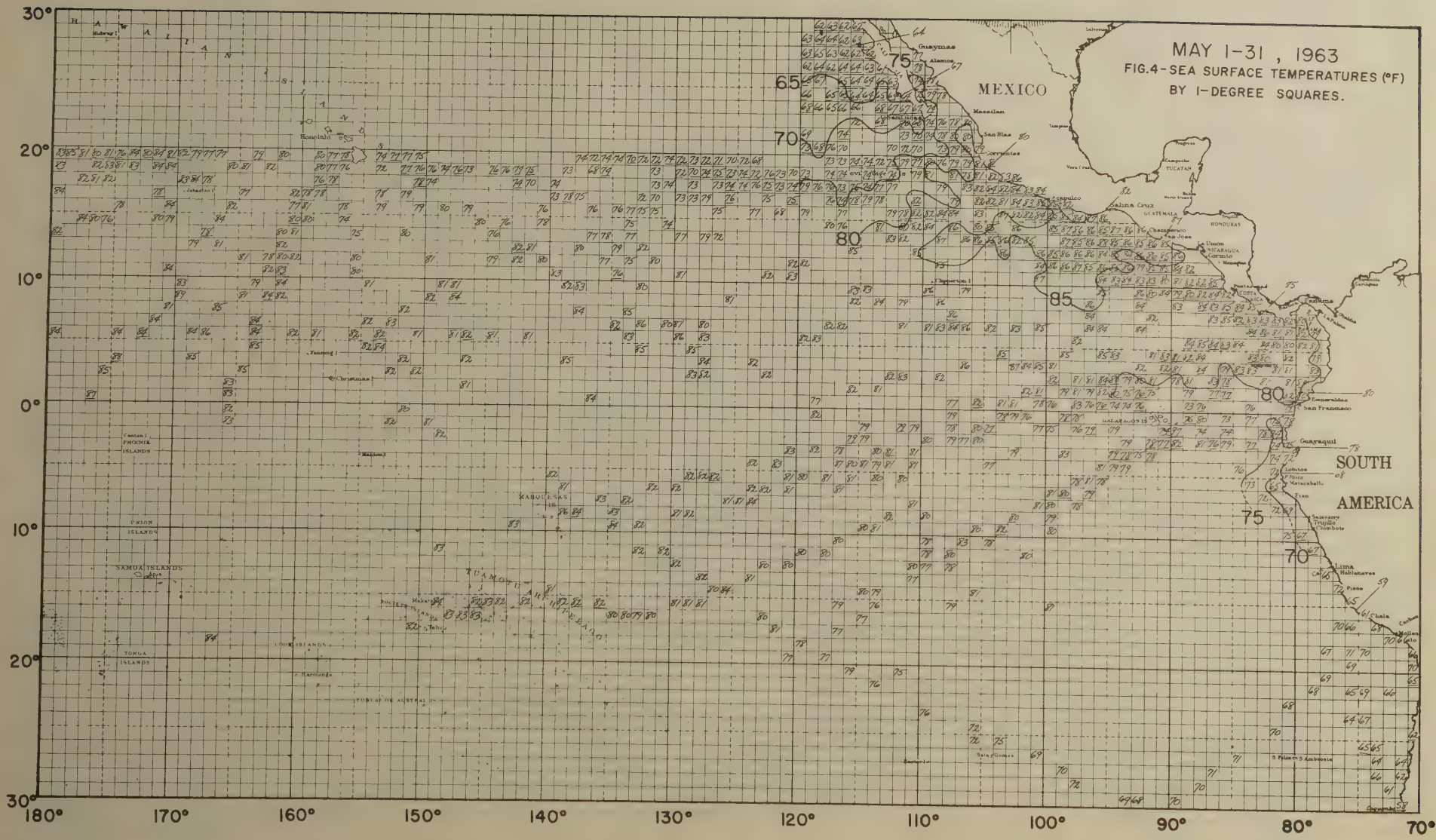
Figure 6.--Deviation of sea surface temperatures (°F) from 12-year mean (1947-1958) by 2-degree squares. Shaded areas colder in 1963.

James A. Renner
Fishery Biologist (General)


MAY 1-31 , 1963
FIG. 1-MEAN SEA SURFACE TEMPERATURES (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


MAY 1-31 , 1963
FIG.2-DEVIATION OF SEA SURFACE TEMP. (°F) FROM LONG TERM MEAN. HATCHED AREAS COLDER IN 1963.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


MAY 1-31 , 1963
FIG.3-DEVIATION OF SEA SURFACE TEMP. (°F)
FROM MAY 1962. HATCHED
AREAS COLDER IN 1963.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


MAY 1-31 , 1963
FIG.4-SEA SURFACE TEMPERATURES (°F)
BY 1-DEGREE SQUARES.
MEXICO
SOUTH
AMERICA
HAWAIIAN ISLANDS
Honolulu
Johnston I.
Christmas I.
Canton I.
PHOENIX ISLANDS
Fanning I.
Hilliary
MARQUESAS
UNION ISLANDS
SAMOA ISLANDS
TUAMOTU ARCH.
Papeete
Tahiti
Moorea
TUBUAI OR AUSTRAL IS.
COOK ISLANDS
TONGA ISLANDS
Rarotonga
Guaymas
Alamos
Mazatlan
San Blas
Manzanillo
Tampico
Campeche
YUCATAN
Acapulco
Salina Cruz
GUATEMALA
HONDURAS
NICARAGUA
Corinto
Champerico
San Jose
Panama
Galapagos Is.
Esmeraldas
San Francisco
Guayaquil
Salaverry
Trujillo
Chimbote
Lobitos
Talara
Malabello
Lima
Hablanaves
Pisco
Chala
Callao
Mollendo
Arica
Iquique
Antofagasta
Valparaiso
Juan Fernandez
Sala y Gomez
S. Felix
S. Ambrosio
Easter I.
65
70
75
80
85
90
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
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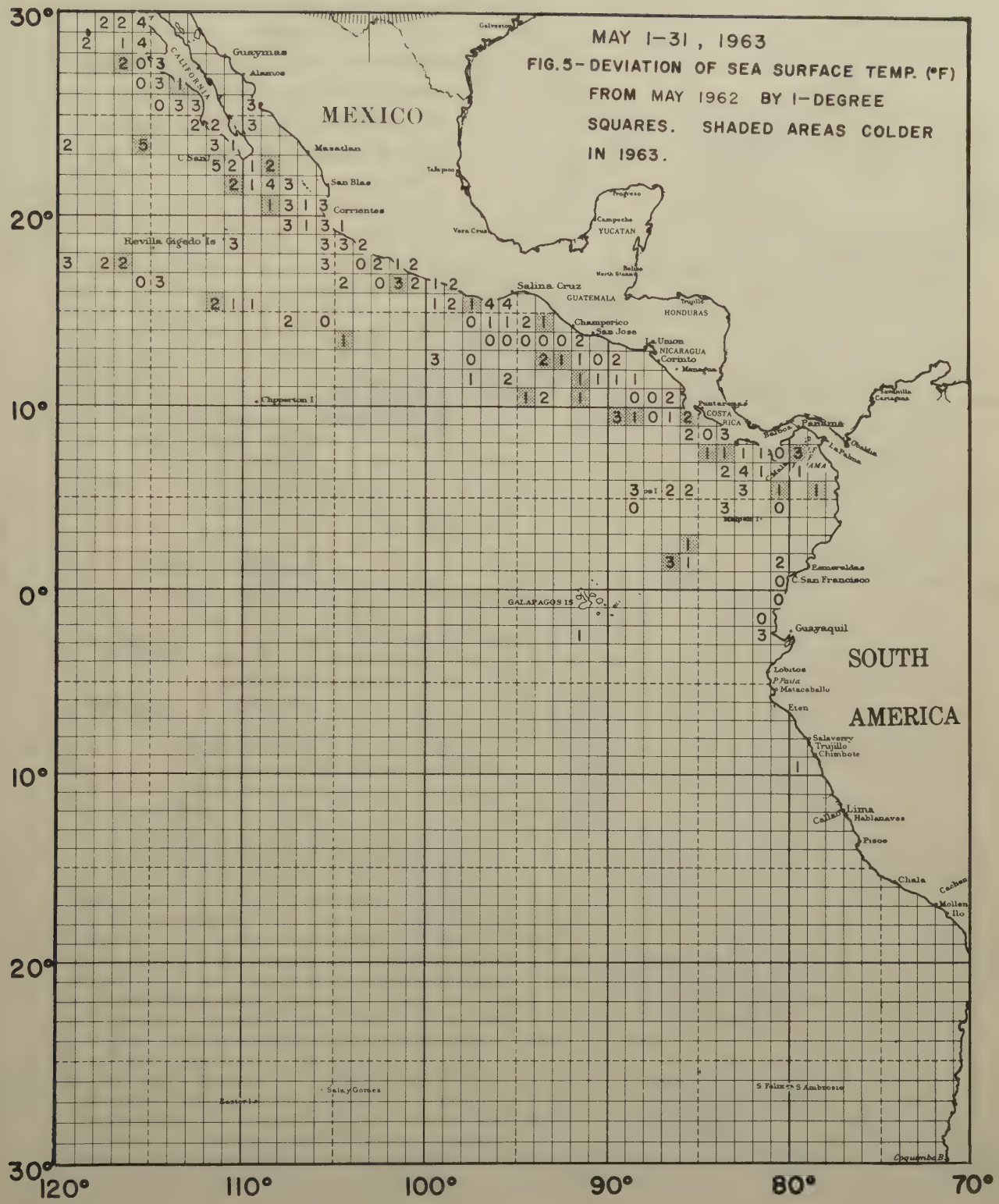
20°
10°
0°


MAY 1–31, 1963
FIG. 5 – DEVIATION OF SEA SURFACE TEMP. (°F) FROM MAY 1962 BY 1-DEGREE SQUARES. SHADED AREAS COLDER IN 1963.
MEXICO
SOUTH AMERICA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
YUCATAN
GALAPAGOS IS
Guaymas
Alamos
Mazatlan
San Blas
Corrientes
Salina Cruz
Champerico
San Jose
La Union
Corinto
Guayaquil
Lima
Callao
Pisco
Chala
Salaverry
Trujillo
Chimbote
Eten
Lobitos
Talara
Esmeraldas
Panama
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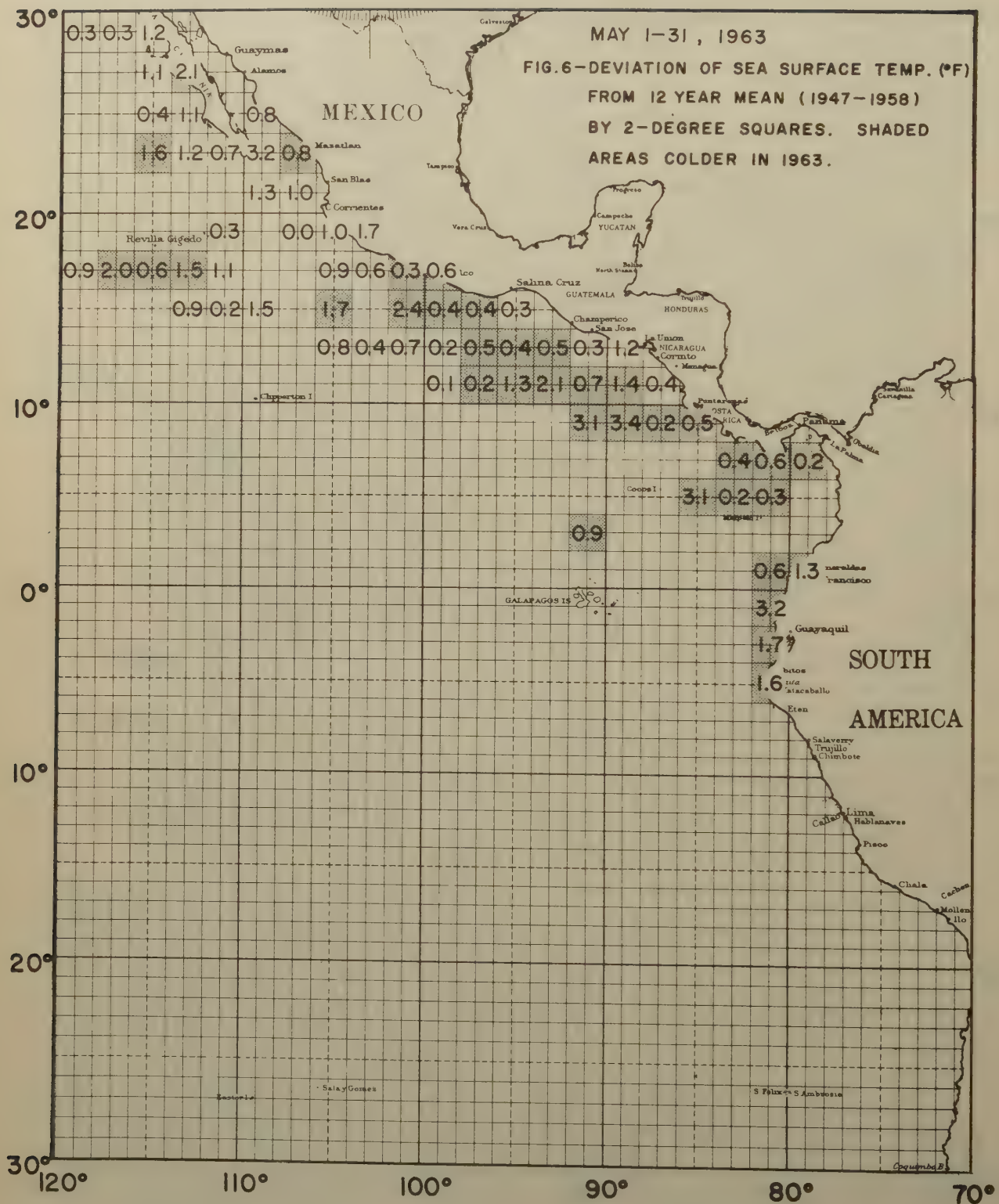
100°
90°
80°
70°


MAY 1–31, 1963
FIG. 6–DEVIATION OF SEA SURFACE TEMP. (°F) FROM 12 YEAR MEAN (1947–1958) BY 2-DEGREE SQUARES. SHADED AREAS COLDER IN 1963.
MEXICO
SOUTH AMERICA
GUATEMALA
HONDURAS
NICARAGUA
YUCATAN
Guaymas
Alamos
Mazatlan
San Blas
C. Corrientes
Salina Cruz
Champerico
San Jose
Corrinto
Managua
Panama
Guayaquil
GALAPAGOS IS
Eten
Salaverry
Trujillo
Chimbote
Lima
Callao
Hablanaves
Pisco
Chala
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20°
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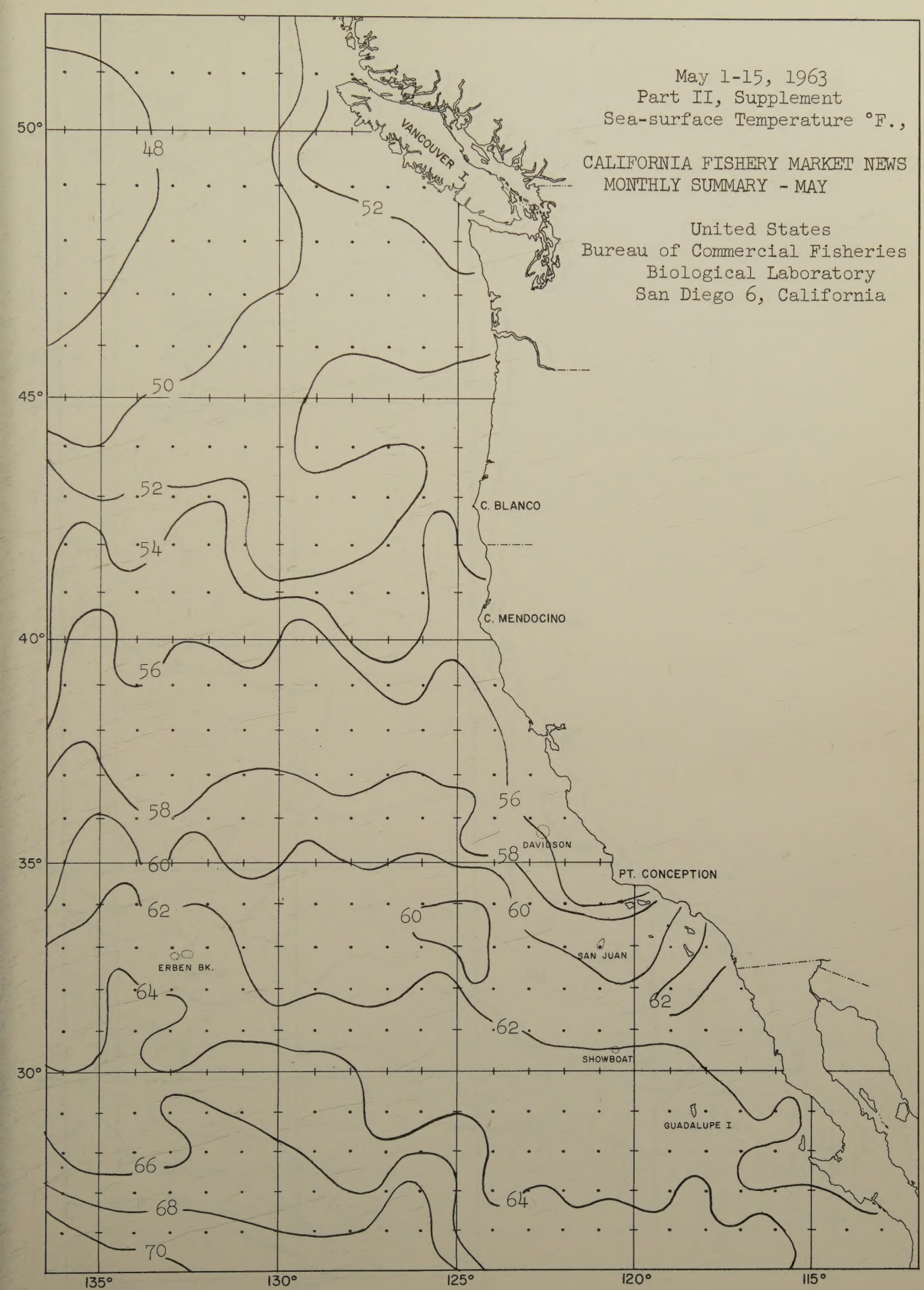
May 1-15, 1963
Part II, Supplement
Sea-surface Temperature °F.,
CALIFORNIA FISHERY MARKET NEWS
MONTHLY SUMMARY - MAY
United States
Bureau of Commercial Fisheries
Biological Laboratory
San Diego 6, California
VANCOUVER I
C. BLANCO
C. MENDOCINO
DAVIDSON
PT. CONCEPTION
SAN JUAN
ERBEN BK.
SHOWBOAT
GUADALUPE I
48
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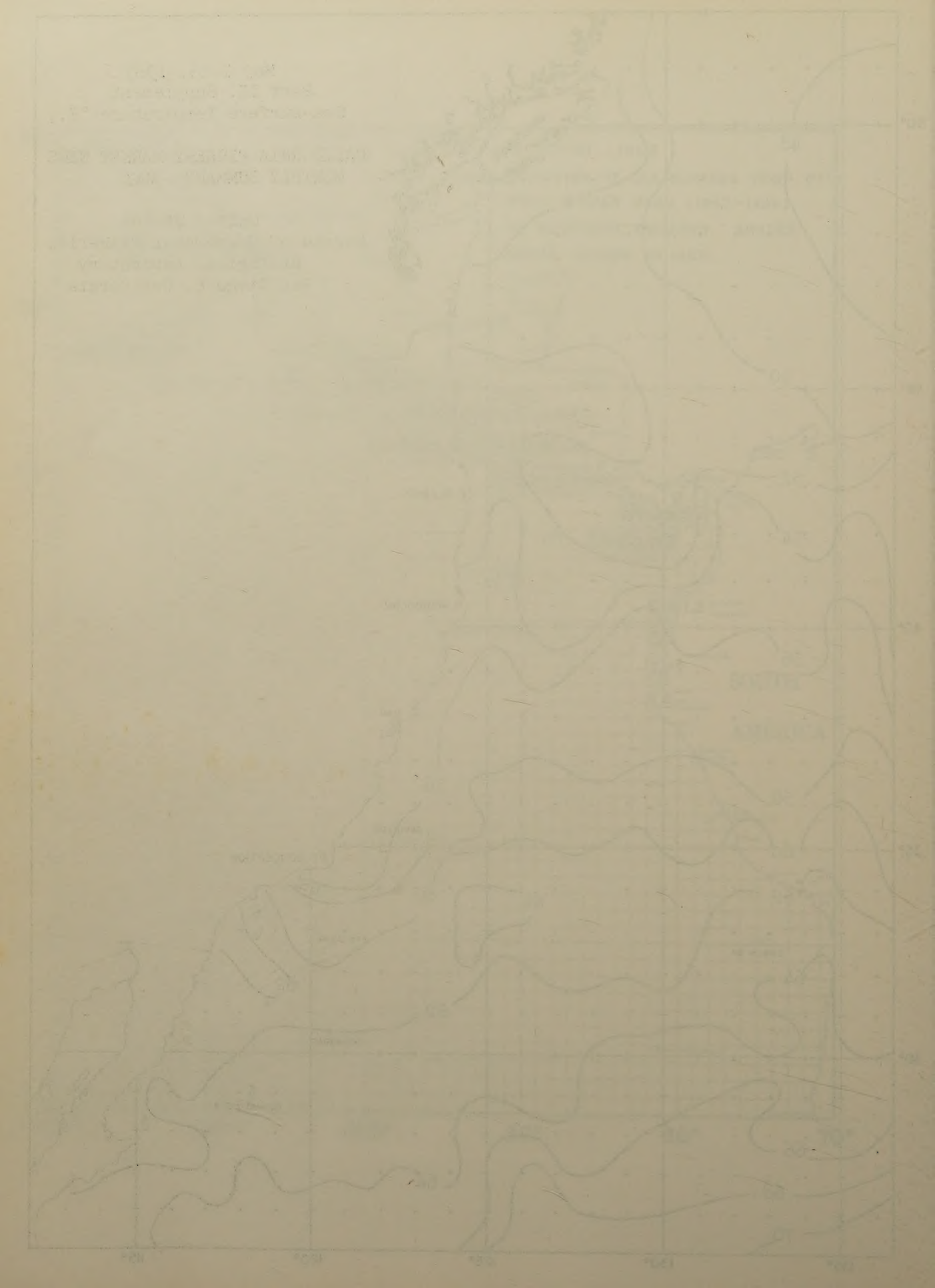

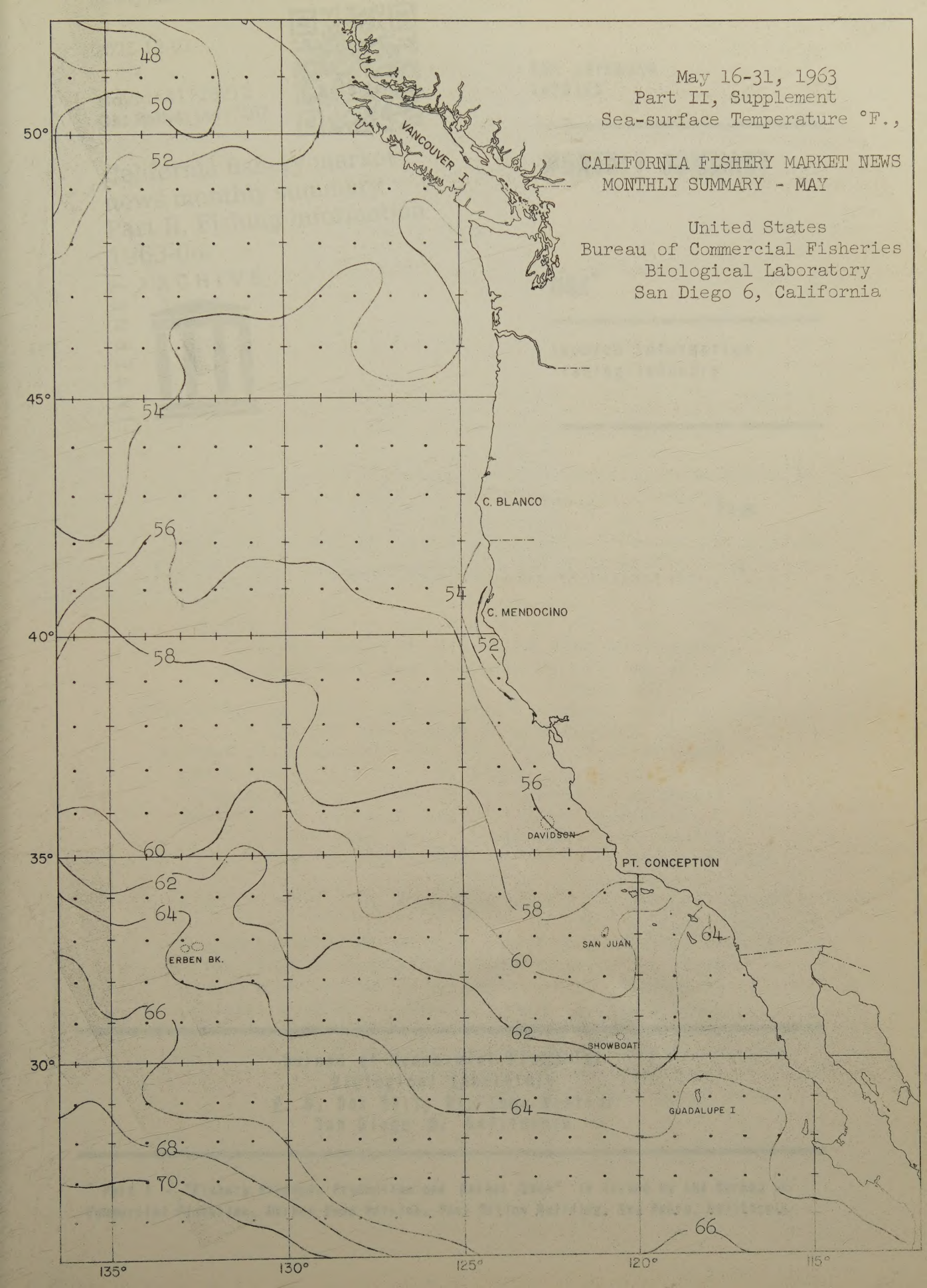
May 16-31, 1963
Part II, Supplement
Sea-surface Temperature °F.,
CALIFORNIA FISHERY MARKET NEWS
MONTHLY SUMMARY - MAY
United States
Bureau of Commercial Fisheries
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VANCOUVER I.
C. BLANCO
C. MENDOCINO
DAVIDSON
PT. CONCEPTION
SAN JUAN
SHOWBOAT
GUADALUPE I
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45°
40°
35°
30°
135°
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120°
115°